SONY INTERNATIONAL (EUROPE) GMBH

Claims

sub 6'

1. Transmission method for transmitting OFDM-signals,
comprising the steps of
modulating said signals onto a plurality of subcarriers using a OFDM-modulation method,
transforming said modulated signals into the time domain, and
transmitting said signals
characterized in
that in said modulating step every M-th subcarrier is modulated with a signal, wherein M is an integer and $M \geq 2$.

2. Transmission method according to claim 1,
characterized in,
that the not modulated subcarriers are set to zero.

3. Transmission method according to claim 1 ~~or 2,~~
characterized in,
that M=2 and only subcarriers with even indices are modulated.

4. Transmission method according to claim 1 ~~one of the claims 1 to 3,~~
characterized in
that said modulation step comprises the steps of
generating integer values form 0 to L-1, wherein L is the number of available subcarriers, and
modulating every M-th signal onto said subcarriers on the basis of said integer values.

5. Transmission apparatus for transmitting OFDM-signals, comprising

modulation means (4) for modulating said signals onto a plurality of subcarriers using a OFDM-modulation method,

transformation means (5) for transforming said modulated signals into the time domain, and

transmission means for transmitting said signals

characterized in

that in said modulation means every M-th subcarrier is modulated, wherein M is an integer and $M \geq 2$.

6. Transmission apparatus according to claim 5,

characterized in,

that in said modulation means (4) the not modulated subcarriers are set to zero.

7. Transmission apparatus according to claim 5 ~~or 6,~~

characterized in,

that in said modulation means (4) M=2 and only subcarriers with even indices are modulated.

8. Transmission apparatus according to claim 5 ~~one of the claims 5 to 7,~~

characterized in

that said modulation means (4) comprises means (10) for generating integer values from 0 to L-1, wherein L is the number of available subcarriers, whereby said modulation means (4) modulates every M-th signal onto said subcarriers on the basis of said integer values.

~~9. Receiving method for receiving OFDM-signals comprising M identical or respectively~~ mirrored wave forms within one ~~OFDM~~-timeburst, wherein M is an integer and $M \geq 2$, comprising the steps of

receiving said OFDM-signals,

~~correlating said wave forms to obtain time synchronization,~~

transforming said signals into the frequency domain, and
demodulating said signals.

10. Receiving method according to claim 9,
characterized in,
that in said correlation step said wave form parts are correlated on the basis of a delay value L1 = S/M and averaged over L2 ≤ S/M samples, whereby S is the total number of samples in one OFDM-timeburst.

11. Receiving method according to claim 9 ~~or 10,~~
characterized in,
that after said correlation step a peak detection step is carried out to provide time synchronization for said transformation of said signals into the frequency domain.

12. Receiving method according to claim 9 ~~one of the claims 9 to 11;~~
characterized in,
that after said correlation step a frequency offset detection step is carried out to provide frequency synchronization for said transformation of said signals into the frequency domain.

~~13. Receiving apparatus for receiving OFDM-signals~~ comprising M identical or respectively mirrored wave forms within one OFDM-timeburst, wherein M is an integer and M ≥ 2 , comprising
receiving means for receiving said OFDM-signals,
correlation means (28, 29, 30, 31) for correlating said wave forms to obtain time synchronization, transformation means (23) for transforming said signals into the frequency domain, and
demodulation means for demodulating said signals.

14. Receiving apparatus according to claim 13,
characterized in,
that in said correlation means (28, 29, 30, 31) said identical wave forms are correlated on the basis of a delay value L1 = S/M and averaged over L2 ≤ S/M samples, whereby S is the total number of samples in one OFDM-timeburst.

15. Receiving apparatus according to claim 13 ~~or 14,~~
characterized in,
that after said correlation means (28, 29, 30, 31) a peak detection means (46) is provided for providing time synchronization for said transformation of said signals into the frequency domain.

16. Receiving apparatus according to ~~one of the claims 13 to 15,~~ claim 13
characterized in,
that after said correlation means (28, 29, 30, 31) a frequency offset detection means (47) is provided for providing frequency synchronization for said transformation of said signals into the frequency domain.

17. ~~Transmission system for transmitting OFDM-signals, comprising~~ a transmission apparatus according to ~~one of the~~ claims 5 to 8 and a receiving apparatus according to one of the ~~claims~~ 13 to 16.

add a17